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MARCH, 1937

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ENTOMOLOGICAL NEWS

VOL. XLVIII. MARCH, 1937 No. 3

Oviposition of Perithemis (Odonata, Libellulidae).

By B. ELWOOD MONTGOMERY, Purdue University, Lafayette, Indiana.

Only a few authors have published observations on the oviposition habits of *Perithemis tenera* (Say), the common amber-winged libelluline of the eastern and southern states. Williamson (1900, Ind. Dept. Geol. Nat. Res., 24 Ann. Rpt., p. 318) wrote, "As in other related species (*Celithemis* and *Sympetrum*) the male retains his hold of the head of the female as she flies along near the surface of the water, occasionally striking the water with her abdomen to release the eggs."

In the following year, Needham (1901, N. Y. St. Mus. Bull. 47: 512) stated that he had worked out the life history of the species at Galesburg, Illinois, in 1895, and he recorded the following observations. "The female is sometimes held by the male while ovipositing, but I have seen her oftener unattended, dropping her eggs on bits of floating dead pond scum by many successive dips made at very nearly the same spot. When a female was taken in hand and 'dipped' to the surface of water in a tumbler, 10 to 20 eggs were liberated by her at each descent."

In the same paper the egg of this species was described. "The egg is oblong oval, at first, white, turning brownish gray after a few hours; its surface is closely beset with minute tuberculate granulations. The gelatinous envelope is scanty."

Both of these statements were repeated without change in "The Handbook" (Needham and Heywood, 1929, A Handbook of the Dragonflies of North America, Thomas, Springfield.) (Page 207.)

Borror (1929, O. Jr. Sci., 30: 412) wrote, "one female was observed ovipositing in the water contained in a little pool

formed by a lily leaf. Another was observed ovipositing on a piece of submerged vegetation."

Sometime during the summer of 1933 Mrs. Leonora K. Gloyd told me of the late E. B. Williamson showing one of his collecting parties, of which she was a member, how the egg mass of this species exploded as it sank in the water. Since that time I have observed oviposition of this species whenever possible, hoping to see this phenomenon. Only one "perfect performance" has been seen.

On July 31, 1934, at a lake near Huntingburg, Indiana, I saw a female *tenera* ovipositing by striking the tip of her abdomen against a small water-soaked stick which extended a few inches above the surface of the water. She remained near the stick and within a few inches of the surface of the water during the time that she was under observation. Successive "dips" were made from a height of three or four inches. The completion of each dip took the female to a corresponding altitude on the opposite side of the stick, where she turned and began another descent. The tip of the abdomen was struck against the stick at or near the surface of the water. This stick was later removed for examination and found to be covered with a gelatinous mass of about one-fourth inch thickness along that part of its length which had been near the surface of the water, extending from slightly above this point to approximately two inches below. After the insect had been observed for a few minutes, she was captured. When she was held by the wings and her abdomen struck against the surface of water, a mass of eggs was released. This mass dropped through the water for a short distance—perhaps, an inch or two—then "exploded," scattering the individual eggs over a comparatively large area. This was repeated several times; the mass of eggs released each time became smaller and smaller until each appeared to consist of only two or three eggs. However, all of the masses, even those consisting of only two eggs, "exploded".

Oviposition by this species has been observed on several other occasions during the past two summers but no other ovipositing female was captured for closer observation. In no case was

the female accompanied by a male during oviposition. Sometimes the eggs were deposited by striking the tip of the abdomen against bits of floating algae or pieces of sticks and stems extending from the water, sometimes by striking the abdomen against the surface of small pools of water in lily leaves, or in hoof prints along the margin of a pond. I have never been able to make close enough observation to determine if the "explosion" occurs when the egg mass is deposited in this manner.

Many females of this species which were not ovipositing when captured have been induced to extrude masses of eggs by striking the abdomen against the surface of water. However, none of these masses "exploded," although the eggs separated readily after being in water a short time.

Sometime ago I discovered in the field notes turned over to me by Mr. Williamson a short time before his death, a record of his (first?) observation of this phenomenon. It was made at Viberg Lake, Allen County, Indiana, August 14, 1921, and is recorded as follows: "Female oviposits unattended by male. Female was held until bunch of eggs extruded; abdomen was touched to water. Bunch of eggs sank an inch or two and burst, scattering eggs widely."

Females of other libelluline genera common in Indiana (*Sympetrum, Celithemis, Libellula*) captured in the act of ovipositing were tested in the same manner. Egg masses usually were secured by striking the abdomen against the surface of water but none of these "exploded."

Notes and Descriptions of West American Cerambycidae (Coleoptera). III.[1]

By E. Gorton Linsley,[2] University of California, Berkeley, California.

[1] The previous papers in this series appeared in Entom. News, 1934, 65:161-165, 181-185, and 1935, 66:161-166.

[2] The writer is indebted to Mr. W. S. Fisher for examination of the two forms described below as new genera and for comparison of these with material in the collection of the United States National Museum and to Dr. Edwin C. Van Dyke, Mr. A. T. McClay, and Mr. H. L. McKenzie for the privilege of studying material from their collections.

Methia juniperi new species.

♂ : small, short, dark piceous, sparsely clothed with short, fine, suberect hairs; antennae piceous; elytra pale testaceous.

Head transverse, width across eyes as great as that of pronotum across middle; surface coarsely, moderately closely punctate; eyes convex, separated above (♂) by more than the diameter of the antennal scape; antennae slender, moderately pubescent, two-thirds as long again as the body (♂); scape subconical, without trace of an apical tooth.

Pronotum a little wider than long, sides rounded, base only very feebly constricted; surface finely, closely punctured, sparsely clothed with moderately long, recumbent pubescence. Elytra about twice as long as broad, much shorter than the body and attaining only basal portion of second abdominal segment; sides gradually narrowed to apical one-third; apices separately rounded, a little dehiscent. Legs slender, moderately finely punctured, clothed with long, suberect, pale hairs; tarsi slender, first segment of posterior pair subequal in length to second and third together.

Ventral surface finely punctured, sparsely clothed with pale, suberect hairs. Length 6mm., breadth 1.3mm.

Holotype male (No. 4150 Calif. Acad. Sci. Ent.), from Palmdale, Mojave Desert, CALIFORNIA, November 21, 1935, reared from *Juniperus californica* by Mr. A. T. McClay, who very kindly submitted the specimen to me for study. The type was reared from twigs which had been girdled by the larvae of *Styloxus bicolor* Ch.&Kn.

This species is related to *M. aestiva* Fall, but may be readily separated by the greatly abbreviated elytra which attain only the second abdominal segment, the absence of a tooth at the apex of the antennal scape, the uniformly punctured pronotum which is wider than long, the dark color of the head, thorax, and abdomen, and the short, sparse pubescence of the antennae and upper surface. From *falli* Martin, which it resembles in general form, it may be distinguished by the widely separated eyes on the vertex (♂), narrowly rounded and dehiscent elytral apices, and by the difference in color.

The species of *Methia* are nearly all rare in collections. *M. mormona* Linell (1896), the earliest described of our western

species, appears to be the most widely distributed and abundant. It occurs throughout the Great Basin area and exhibits considerable variation in size and coloration in various portions of its range. A small series sent to the writer from Globe, Arizona by Mr. Frank Parker, differs from the typical form in being pale testaceous rather than dark brownish piceous, and the elytra are without ornamentation. This pale form appears to be merely a color variety and examples were captured along with typical specimens. *M. aestiva* Fall (1907) and *M. arizonica* Schiffr. (1908) are probably represented in collections by less than two dozen examples each. *M. falli* Martin (1920) is known at present only by the type. *M. brevis* Fall (1929) was likewise described from a unique but a second example has been recorded from Lower California.[3] In the writer's collection are three additional males from San Diego County, California, and what appears to be a female of this species from Claremont, California. The latter is stouter and more robust than the males, and the elytra are ornamented with pale vittae.

PSEUDOMETHIA, new genus.

Head transverse; labrum ciliate with long fine hairs; palpi very unequal in length, the maxillary longer, last segment subcylindrical, apex truncate; eyes very large, convex, coarsely faceted, emarginate; antennal tubercles not strongly elevated, separated by a narrow furrow on vertex; antennae longer than the body, basal segments rather stout, segments three to five very finely, feebly carinate; scape subconical, more than twice as long as broad, second segment wider than long, about one-fourth the length of the scape, third segment not quite as long as scape, enlarged apically, fourth segment about one-fourth longer than third, subcylindrical, fifth, sixth, and seventh segments subequal in length, about twice as long as scape, remaining segments becoming a little shorter and more slender to the apex.

Pronotum about as long as broad, sides with an obtuse, con-

[3] Linsley, E. G., *Studies in the Cerambycidae of Lower California,* Pan-Pacific Ent. 10:59, 1934.

ical, lateral tubercle a little behind the middle. Elytra abbreviated, not attaining apex of first abdominal segment; apices separately rounded. Legs slender; anterior femora feebly clavate, middle and posterior pairs slender; tarsi elongate, narrow, first segment of posterior pair much longer than second and third segments together. Anterior coxae prominent, conical, cavities large, confluent, angulated externally, open behind; middle coxal cavities open externally. Abdomen with six visible segments; sixth ventral segment of male excavated at apex.

Genotype: *Pseudomethia arida* n. sp.

This genus is based upon a species which diverges markedly in the structure and proportions of the antennae from other known Methiini, but which seems better placed in this tribe than in any other described group. In the previously known Methiini the antennae are very long and slender (usually about twice as long as the body in the male, a little longer than the body in the female), with the segments narrow and rather uniform in width, the second very small, often scarcely visible, the third segment longer than either the scape or following segments. In the present genus the basal antennal segments are stout, the antennae but little longer than the body in the male, the second segment large and conspicuous, the third segment shorter than either the scape or fourth segment and slightly enlarged at the apex, and segments three to five very finely and feebly carinate.* The posterior tarsi (which are short in other Methiini) are very long and slender, distinctly more than half as long as the tibiae, and the pronotum is armed laterally with an obtuse, conical tubercle.

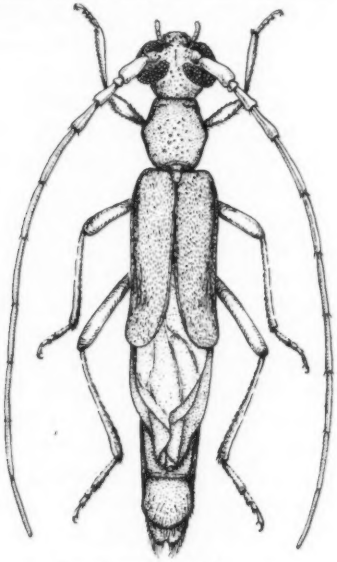
Pseudomethia arida new species (fig).

♂ : small, slender, brownish, testaceous. Head sparsely clothed with short, fine, pale hairs; vertex coarsely punctured with numerous small punctures intermixed; eyes separated on vertex by approximately the diameter of the antennal scape, less widely separated below; antennae sparsely clothed with very short, fine pubescence and with one or two long setae at apex of segments. Pronotum moderately punctured, clothed

* These carinae are visible only under low power magnification.

with short, fine, suberect, pale hairs intermixed with scattered, long, erect setae. Elytra somewhat granulate-punctate, surface clothed with short, suberect, sparse pubescence. Legs more densely clothed with long flying hairs. Ventral surface shining; abdomen very finely, sparsely, punctured and pubescent. Length 7 mm., breadth 1.3 mm.

Holotype male (No. 4161 Calif. Acad. Sci. Ent.), taken from *Simmondsia californica,* in the desert about ten miles



Pseudomethia arida n. sp.

west of Indio, CALIFORNIA, on September 9, 1935, by Mr. Howard L. McKenzie, to whom the writer is indebted for the specimen.

A small, uniformly brownish species, somewhat suggestive of a *Methia* but readily distinguishable by the generic characters.

GYMNOPSYRA, new genus.

Head short, transverse; eyes coarsely granulated, emarginate; labrum transverse, ciliate; palpi short, antennal tubercles depressed, contiguous; antennae eleven-segmented, stout, shorter

than the body (♀), segments three to seven with a stout spine at the apex, three to ten ciliate at apex; scape stout, slightly conical, about as long as segments two and three together; second segment a little longer than broad, third segment about four times as long as second, fourth segment about one-fourth shorter than third, segments five, six, and seven subequal in length to third, remaining segments slightly shorter, more slender, except eleventh which is longer than tenth.

Pronotum a little broader than long, sides rounded. Scutellum transverse, subtriangular. Elytra about three times as long as broad, parallel-sided; apices rotundate-truncate. Legs slender; femora not clavate; tibiae carinate; tarsi with first segment of posterior pair subequal to two following together. Prosternum narrow between the coxae; anterior coxae globular, cavities feebly angulated; mesosternum broad between the coxae, separating them by about twice the distance between the anterior coxae; middle coxae globular, cavities closed externally.

Genotype: *Gymnopsyra phoracanthoides* n. sp.

A genus apparently related to *Psyrassa* and *Stenosphenus* but differing from these in the non-carinate antennae, rotundate rather than emarginate or spinose elytral apices, and the rounded, coarsely sculptured pronotum (in *Psyrassa* the pronotum is cylindrical, in *Stenosphenus* wedge-shaped, in both genera usually sparsely punctured and shining). The spine on the third antennal segment is moderate as in *Stenosphenus* and the elytral punctation is of the *Stenosphenus* type (the punctures coarse and dense in the basal area and becoming very much finer, sparser apically).

Gymnopsyra phoracanthoides new species.

♀: elongate, piceous, shining, sparsely clothed with very short, fine hairs; antennae and legs rufo-piceous. Head coarsely, moderately closely punctured. Pronotum very coarsely, densely punctured, the punctures tending to become confluent; disc with a small, smooth, median polished area. Scutellum finely punctured, finely pubescent along apical margin. Elytra very coarsely punctured at base, the punctures becoming much finer, sparser apically. Prosternum coarsely punctured, anteriorly transversely rugose. Mesosternum coarsely, closely punctured.

Metasternum and abdomen more sparsely and less coarsely punctured, sparsely clothed with pale, suberect hairs. Fifth ventral abdominal segment truncate at apex (♀). Length 12 mm., breadth 3 mm.

Holotype female (No. 4152 Calif. Acad. Sci. Ent.) from Glen Ranch, Alpine, TEXAS, 1926, O. C. Poling collector (Van Dyke Collection, Calif. Academy of Sciences).

The Membracidae of Nebraska (Homoptera).

By HAROLD C. JONES, Berry College, Mount Berry, Georgia.

The investigation summarized in this paper is concerned with the tree-hoppers found in Nebraska by associates of the University of Nebraska during the half century preceding 1933. Data are offered regarding abundance, geographic and seasonal occurrence and host relations. The writer has studied the membracids in the collection of the University of Nebraska, Department of Entomology, and has made special field studies during the years 1932 and 1933. Many specimens, with pertinent data, were collected during a trip through the peripheral counties of Nebraska in the summer of 1932.

The nomenclature and arrangement of species herein used follows that of W. D. Funkhouser's General Catalogue (1927). Of the fifty genera and one hundred eighty-five species listed by Funkhouser as occurring within the United States, the Nebraska fauna includes eighteen genera with forty species and six varieties. The species verified by a specialist, Dr. E. D. Ball, Economic Zoologist of the Arizona Agricultural Experiment Station, are succeeded by the symbol (B). The author gratefully acknowledges the valuable assistance of Dr. Ball, as well as that of Professors M. H. Swenk, D. B. Whelan and Raymond Roberts of the University of Nebraska.

CAMPYLENCHIA LATIPES (Say) (B). Of general distribution; collected from May 20 to September 25, most commonly in July. This is the most abundant treehopper in the state, being represented by about 400 specimens in the collection. Alfalfa is the favorite host and is at times reported damaged by this insect. The wide variety of hosts includes: oak, snowberry (*Symphoricarpos* spp.), rose; and more than 20 herbaceous species, of which alfalfa, sweet clovers, ragweeds and

goldenrod are the most frequent.

ENCHENOPA BINOTATA (Say). Collected from the northern more wooded parts of Nebraska: Cass, Lancaster, Rock, Keya Paha, Dawes and Sioux Counties, June 29 to July 25; 36 specimens of each sex. Hosts: bittersweet (*Celastrus scandens*), oak, ash, hickory, and but one herb, ragweed.

ACUTALIS TARTAREA Say. A single male specimen, collected at Plattsmouth, Cass County, July 3. Miss Branch (1914) reported giant ragweed (*Ambrosia trifida*) as the host of this species in Kansas.

MICRUTALIS CALVA (Say) (B). The smallest treehopper of our region. It is often abundant on ironweed in moist pastures. Collected, June 5 to November 27, in Douglas, Cuming, Pawnee, Lancaster, Jefferson, Nuckolls, Franklin and Harlan Counties, Nebraska. Seventy females and twenty-five males. Hosts: Ironweed (*Vernonia baldwini*), honey locust, sand-bar willow, Canada fleabane (*Leptilon* sp.), alfalfa, *Euphorbia marginata*, wild hemp (*Cannabis* sp.), and common sunflower.

M. CALVA var. No. 9, Ball and Stone Monograph (MSS). (B). A very pale color variety. Taken in Lancaster, Jefferson and Harlan counties; July 28 to September 27. Not common.

STICTOCEPHALA COLLINA Van Duzee (B). Rare in Nebraska, taken in only the extreme western counties. The records are previous to 1909. Two females were collected in Monroe Canyon and a male in the "Badlands," both locations in Sioux County, 1908. Dr. Ball reports having taken a female of this species at Kimball, Kimball County. These few individuals were collected during August 2 to 12.

S. FESTINA (Say). One specimen, a male, collected at Omaha, Douglas County, Nebraska, November 8, seems to be of this species. It is known from the four bordering states, Iowa, Missouri, Kansas and Colorado.

S. INERMIS (Fabricius) (B). A common species of wide distribution. In Nebraska it has been taken in Dixon, Douglas, Cass, Lancaster, Gage, Colfax, Webster, Antelope, Rock, Keya Paha, Cherry and Sioux counties. The 68 females and 69 males in the collection were taken during June to mid-August. Host plants include eleven species of herbs, of which grass, bush morning glory, prairie clover, wild hemp and sunflower are most frequent, also such shrubs as snowberry, bittersweet and rose, and trees; willows and oak.

S. LUTEA (Walker) (B). Taken from willow and grass in

Cuming, Lancaster, Keya Paha, Brown and Dawes counties during the season May 17 to July 9. 25 ♀ and 9 ♂ specimens collected.

CERESA BOREALIS Fairmaire (B). Chiefly northern, taken from Rock, Holt, Burt, Cass, Cuming, Lancaster, Gage, Pawnee, Keya Paha, Cheyenne and Dawes counties during the period from July 3 to August 17. It prefers the moist wooded areas favoring its hosts: wild hemp, alfalfa, *Psoralea* sp., giant ragweed, common ragweed, Canada anemone, prairie clover, snowberry, smooth sumac, elderberry, apple, elm and oak. 49 ♀, 115 ♂. *C. brevicornis* Fitch is a synonym.

C. BREVIS Walker (B). One specimen collected on low prairie, near Lincoln, Nebraska, July 19, 1928, by Professor Whelan has been identified as of this species by Dr. Ball. The species is catalogued by Dr. Funkhouser as occurring only farther east, in Kentucky and New York.

C. BUBALUS (Fabricius) (B). The widespread and abundant "buffalo tree hopper." It occurs throughout the state. 211 ♂, 158 ♀ specimens of the collection were taken from June 24 to October 8. Alfalfa is preferred; wild hemp and ragweed are favorites among the remaining twenty-three herbaceous hosts. Seven tree species and five shrub species serve as hosts.

C. CONSTANS (Walker) (B). Three specimens, Rock and Keya Paha counties, collected from July 24 to August 12, on ragweed (*Ambrosia*). Van Duzee records basswood (*Tilia* sp.) as a host of this species.

C. DICEROS (Say) (B). Prefers wooded parts of the state. The 29 ♂ and 19 ♀ were taken from Cass, Burt, Dakota, Cuming, Lancaster, Gage, and in the west, Dawes and Sioux counties. Hosts: elderberry and grape. Nymphs have been taken from strawberry. Seasonal range: July 3 to August 10.

C. TAURINA Fitch (B). A common species, widely distributed in Nebraska. It prefers the undergrowth in wooded areas. Hosts include ragweed, alfalfa, wild hemp, white sweet clover, millet and knotweed (*Polygonum* sp.); snowberry and elderberry; apple, willows, white elm and oak. Seasonal occurrence: July 1 to October 7.

C. VITULUS (Fabricius) (B). One female each from West Point, Niobrara and Hogans Bridge, north central Nebraska; mid-July to early August.

CARYNOTA MERA (Say) (B). One female, from Lincoln, August 8, on Ironweed.

THELIA UHLERI Stal. (B). Two males, one from Lincoln,

July 14, and one from Glen, Sioux County, August 10. Wild Plum is the host.

GLOSSONOTUS UNIVITTATUS (Harr.) (B). A male and a female, collected June 8 and 24, respectively, at Springview Bridge, Brown County; on oak.

G. TURRICULATUS (Emmons). In his monograph on the Telamonini Dr. Ball reports having examined material of this species from Nebraska. Hawthorn (*Crataegus* sp.) is the host.

G. CRATAEGI (Fitch). Dr. Funkhouser credits L. Bruner with determination of this species from Nebraska. No specimens in the collection.

HELIRIA GIBBERATA Ball. A female of this species (specimen now in the Osborn collection) is recorded by Ball from Lincoln, Nebraska, on Hackberry.

PALONICA PYRAMIDATA (Uhl.) (B). A female from Omaha and a male from Carns, Keya Paha County, taken on July 25, represent this species for Nebraska. Dr. Ball notes that he has taken this species in abundance on black willow wherever he has collected. A single specimen of the variety *declivata* is recorded by Ball, collected by Barber in northwest Nebraska. This is an arbitrary variety and occurs everywhere with the typical *Palonica pyramidata.*

P. VIRIDIA Ball (B). A specimen taken at Lincoln, in hibernation on cottonwood, was determined some years ago by Ball as *Telamona viridia,*. The usual host is cottonwood (*Populus deltoides*).

TELAMONA AMPELOPSIDIS (Harris) (B). Dr. Ball has determined a specimen of this species taken in Nebraska by W. D. Pierce. Five other female specimens of the species in the University collection, taken on Virginia Creeper at Whitney, Dawes County, are dated from July 20 to August 4.

T. COMPACTA Ball (B). A single specimen taken at West Point, Cuming County, in June, represents this species in the Collection.

T. MACULATA Van Duzee. This species is recorded by Ball as having been collected in Nebraska by W. D. Pierce, on bur oak.

T. MONTICOLA (Fabricius) (B). A female specimen in the University collection has been determined by Ball as *T. querci* Fitch, a synonym of *T. monticola* (Fabricius). This specimen is from Springview Bridge, June 16. A second female in the collection, from the same place, dates June 20.

T. RECLIVATA Fitch (B). A female from Springview Bridge and two females from West Point, the three collected during

late June, bear Dr. Ball's identification as belonging to this species. Oaks are the usual hosts.

T. WESTCOTTI Goding (B). One female, taken at Glen, Sioux County, August 15. Bur oak is the favorite host.

ARCHASIA GALEATA (Fabricius) (B). Three females, two from Springview Bridge, June 16, and one from Lincoln, July 11. Hosts: oak.

ATYMNA QUERCI. (Fitch) (B). Thirteen females have been taken at Carns and Springview Bridge, during season from June 16 to July 28, on oak.

CYRTOLOBUS FULIGINOSUS (Emmons.) var. undet. Ball. A male collected at Crete, Saline County, May 21, 1932, by Miss D. M. Johnson, has been identified by Dr. Ball as a variety of *C. fuliginosus*.

C. MACULIFRONTIS (Emmons). (B). Taken at Ulysses, Butler County, at West Point, and at Carns and Springview Bridge, June 16 to August 12. 150 ♀, 75 ♂, mostly from oak.

C. VAU (Say) (B). A common species on oak. Taken at Carns, Keya Paha County, Springview Bridge, Brown County, and at West Point, Cuming County, June 16 to July 16. 44 ♂, 16 ♀.

C. VAU, var. INERMIS Emmons (B). Possibly a common variety, but easily confused with *C. maculifrontis*. Three females, taken at Carns and Springview Bridge, June 17 to 20, have been determined by Dr. Ball as probably of this variety.

VANDUZEA VESTITA Goding (B). Found generally over the state, except in the Northwest, on a variety of herbs, shrubs and trees; wild indigo and snowberry are the most frequent hosts. Seasonal range: July 16 to August 23.

ENTYLIA CARINATA Forest. (B). Two males, taken at Weeping Water, Cass County, September 24.

E. CONCISA Walker (B). An uncommon but gregarious species. Found at Nebraska City, Otoe County, and at the Nebraska Fisheries, Sarpy County. 30 ♀ were collected on thistle (*Carduus undulatus*), apparently ovipositing. May 27. Dr. Ball opines that *E. carinata* Forest is the correct name for the entire group, and that the other names (*E. concisa*, etc.) should be relegated to varietal positions.

PUBLILIA CONCAVA (Say) (B). Nebraska City, north and west to Carns, May 12 to September 25, 89 ♀, 7 ♂. Hosts: ragweed, oak and sunflower (*Helianthus maximilianus*).

P. CONCAVA var. NIGRIDORSUM Goding (B). A female from ragweed, at Carns, July 1.

P. MODESTA Uhler. Taken at Carns, west to the northwest

border of the state; June 20 to July 30. 60 ♂, 39 ♀. Hosts: *Ambrosia* (ragweed) and oak.

P. MODESTA var. BICINCTURA Goding (B). A male, taken at Carns, July 30.

P. RETICULATA VanDuzee (B). Collected at Weeping Water, Nehawka and Plattsmouth, Cass County, Fort Crook, Sarpy County and at Nebraska City, May 15 to July 5. 20 ♀, 6 ♂.

In addition to the Membracids listed above as having been taken in the state of Nebraska according to the records given, the following species probably occur within the state since they have been taken from two or more sides of Nebraska and usually from host plants known to occur within our borders: *Acutalis semicrema* (Say), *Glossonotus acuminatus* (Fabr.), *Heliria cristata* (Fairm.), *Palonica pyramidata* var. *nasuta* Ball., *P. tremulata* Ball, *Telamona collina* (Walker), *T. decorata* Ball, *T. extrema* Ball, *T. spreta* Goding, *T. tiliae* Ball, *T. tristis* Fitch var. *tristis* Fitch, *T. tristis* Fh. var. *coryli* Fitch, *T. unicolor* Fitch, *Archasia belfragei* Stal., *Smilia camelus* (Fabr.), *Cyrtolobus fenestratus* (Fitch), and *Ophiderma salamandra* Fairmaire.

On some Thysanoptera from American Conifers.

By J. DOUGLAS HOOD, University of Rochester, Rochester, New York.

Two of the species treated below are new; the other is widely distributed in Europe, but has not previously been recorded from America. The types of the new species are in the author's collection.

TÆNIOTHRIPS PINI (Uzel), Figs. a and b.

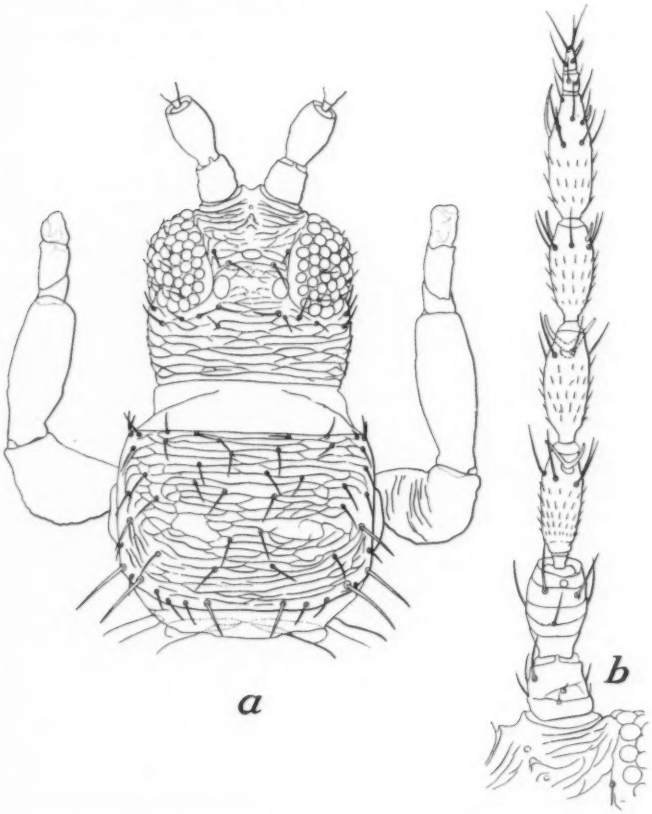
In Europe this species is known from Bohemia, Austria, Germany, Poland, England, Sweden, and Finland. It feeds upon the leaves of pine, spruce and fir. I found it to be very common in August and September, 1931, on young needles of black spruce (*Picea mariana*) growing on several islands in Lake Superior, near Grand Portage, Minnesota (23 ♀ ♀ are before me). It was also observed on the same plant in Canada, just across the Pigeon River from Minnesota, though no specimens were collected.

The above material has been compared with authentic

European specimens by both Dr. Priesner and myself and, aside from the slightly darker color of the American individuals, there are no differences.

Oxythrips coloradensis sp. nov.

♀ (macropterous). Length about 1.3 mm. (slightly distended, 1.4 mm.). Color yellow in head and prothorax (the



Tæniothrips pini (Uzel), ♀. *a*, head and prothorax (all setæ omitted from appendages; sculpture necessarily accentuated); *b*, right antenna. (Drawn by Mrs. Philip T. Bassett; camera lucida.)

latter slightly darker), orange-yellow in pterothorax and abdomen; legs yellow; fore wings pale yellowish, somewhat gray at apex; antennæ with segment I yellow, paler than head, II-V light yellowish brown, II and III yellow at base, IV somewhat darkened at apex and often paler at or near base, V-VIII nearly uniform brown, not darker than apical portion of IV, V often pale basally; setæ or antennæ pale gray, all other setæ pale yellowish; ocellar pigmentation brilliant vermilion.

Head about 1.13 times as long as greatest width across cheeks and about 1.1 times as long as transocular width, broadest near base, the cheeks almost perfectly straight and tapering slightly to eyes, where the width is about 0.94 that across eyes; vertex flattened, its front evenly declivous; frontal costa with a small but distinct notch; dorsal surface of head cross-striate posterior to ocelli, the striæ producing a distinct serration of the cheeks; two pairs of minute (14 micra) setæ forming a slightly arcuate line across head in front of median ocellus, the median pair 22-25 micra apart, the other pair about 54 micra apart; interocellars 27 micra long and arising just outside the ocellar triangle; three pairs (11-14 micra) behind inner, posterior margin of eyes (the middle of these more anterior than the others and usually about 15 micra behind posterior margin of eyes); three additional pairs of setæ in front of middle of cheeks. Eyes relatively small, about 0.4 the length of head, slightly protruding, measuring as follows, in micra, in one paratype: dorsal length 55 micra, width 34 micra, interval 61 micra. Ocelli of posterior pair about on a line marking off posterior fourth of eyes, their diameter about 13 micra; interval about 28 micra, distance from median ocellus about 20 micra; median ocellus much smaller. Antennæ only 1.7 times the length of head and about 1.86 times the transocular width, of perfectly normal structure; segment III about 46 micra; VI without subapical, transverse, ventral suture.

Prothorax about 0.75 as long as head and only 1.4 times as wide as long; dorsal surface with a few indistinct cross-striæ both anteriorly and posteriorly; major seta at posterior angles 25-33 micra long; posterior margin with three pairs of setæ between the major pair, the innermost of these about 20 micra and longest. Legs normal in structure; fore tarsus with a minute terminal tooth on inner surface. Wings of fore pair with about 25 short setæ on costal margin, those at middle of wing about 25 micra; fore vein typically with $1 + 4 + 3$ setæ in basal third, 1 beyond middle, and 2 near tip; hind vein with 7-9 (usually 9) nearly equally-spaced setæ.

Abdomen of normal form and structure; setæ on tergum IX normal in structure (i.e., not as in *O. flavus*), the dorsal pair about 73 micra, dorso-lateral 87 micra, lateral 74 micra; X not elongate or tubiform, its dorsal setæ 74 micra, dorso-laterals 87 micra; tergum VIII without comb.

Measurements of ♀ (holotype), in mm.: Length about 1.3 (slightly distended, 1.38); head, length 0.143, width across eyes 0.131, least width just behind eyes 0.123, greatest width across cheeks 0.127; prothorax, median length of pronotum 0.107, greatest width 0.148; mesothorax, greatest width 0.204; metathorax, greatest width 0.186; fore wings, length 0.707, width at middle 0.042; abdomen, greatest width (at segment IV) 0.241; segment X, length 0.079, greatest subbasal width 0.062.

Antennal segments:	1	2	3	4	5	6	7	8
Length (micra)	21	40	46	38	36	41	9	13
Width (micra)	27	25	18	19	19	20	8	5

Total length of antenna 0.244 mm.

COLORADO: Boulder, June 14, 1924, L. O. Jackson, miscellaneous collecting, 3 ♀ ♀; Boulder (Gregory Canyon), June 21, 1924, L. O. Jackson, in flowers of *Pinus scopulorum*, 6 ♀ ♀ (including *holotype*).

This very distinct little species is allied to *ajugæ* by the presence of a minute terminal tooth on the fore tarsus, but differs conspicuously from that species and its other congeners in that the head is distinctly longer than wide and the cheeks nearly straight.

Oxythrips pinicola sp. nov.

♀ (macropterous). Length about 1.2 mm. (distended, about 1.5 mm.). *Color* yellowish brown, somewhat paler anteriorly, the pterothorax with an orange cast, the abdomen overlain with gray; legs dull yellow, femora and sometimes the tibiæ lightly and obscurely shaded with brownish on outer surface; wings of fore pair very pale yellowish gray, the veins just perceptibly darker; antennæ with segment I pale yellowish and about concolorous with tibiæ, II very slightly darker and shaded with grayish, III a trifle darker than II, more yellowish in color, somewhat infuscate apically, IV-VIII yellowish gray-brown, darker than abdomen, IV and V often yellowish basally, VII and VIII paler than VI; ocellar pigmentation bright red.

Head about 0.74 as long as greatest width across cheeks and about 0.77 as long as transocular width, broadest at basal third

of cheeks, these tapering to eyes and very slightly narrowed to base; vertex somewhat rounded, its front nearly vertical; frontal costa rather deeply notched; dorsal surface cross-striate between posterior ocelli and base of head, the more posterior striæ heavier, more distinct, and producing a serration of the cheeks; one pair of small setæ (23 micra apart) in front of median ocellus, a second similar pair directly laterad of median ocellus and close to inner margins of eyes, an interocellar pair 33 micra long just outside the ocellar triangle, three pairs (16-20 micra) near inner, posterior margin of eyes (the middle of these more anterior than the others and on a line with posterior margin of eyes), and two shorter (13 micra) pairs at anterior third of cheeks, all of these setæ pale yellowish. *Eyes* about 0.5 the length of head, very slightly protruding, somewhat more than one-half as wide as their interval, measuring as follows, in micra, in one paratype: dorsal length 58, width 38, interval 74. *Ocelli* of posterior pair situated a trifle in advance of middle of eyes, their diameter 15 micra, interval 36 micra, distance from median ocellus 23 micra; median ocellus 13 micra. *Antennæ* about 2.56 times the length of head and very nearly twice the transocular width, of perfectly normal structure, though longer and more slender than usual; segment III 44-55 micra (averaging 49 micra); VI without subapical, transverse, ventral suture. *Mouth-cone* about 113 micra long (measuring from base of labrum); maxillary palpal segments 16, 11, and 14 micra, respectively.

Prothorax about 0.96 as long as head and 1.9 times as wide as long; dorsal surface with two or three heavy, interrupted cross-striæ close to posterior margin and with its anterior portion more faintly striate; major seta at posterior angles yellow and 64 micra long; posterior margin with four pairs of setæ between the major pair, the innermost of these about 23 micra and longest. Legs normal in structure; fore tarsus not toothed. Wings of fore pair with about 32 pale yellow setæ on costal margin, those at middle of wing about 43 micra; fore vein with 4 + 4 in basal third, 1 at middle, and 2 near tip; hind vein with about 9 nearly equally spaced ones.

Abdomen of normal form and structure; setæ on tergum IX brownish yellow, normal in structure (i.e., not as in *O. flavus*), the dorsal pair about 105 micra, dorso-lateral 111 micra, lateral 113 micra, ventro-lateral 97 micra; X not elongate or tubiform, its dorsal setæ about 97 micra, dorso-laterals 87 micra; tergum VIII without comb.

Measurements of ♀ (holotype), in mm.: Length about 1.2 (fully distended, 1.44); head, length 0.115, width across eyes 0.150, least width just behind eyes 0.145, greatest width across cheeks 0.155; prothorax, median length of pronotum, 0.100, greatest width 0.192; mesothorax, greatest width 0.270; metathorax, greatest width 0.239; fore wings, length 0.882, width at middle 0.067; abdomen, greatest width (at segment IV) 0.308; segment X, length 0.090, greatest subbasal width 0.078.

Antennal segments:	1	2	3	4	5	6	7	8
Length (micra): ...	23	43	53	47	40	57	12	19
Width (micra): ...	30	28	23	21	19	20	7	5

Total length 0.294 mm.

♂ (macropterous). Length about 0.92 mm. (fully distended, 1.13 mm.). Color light grayish yellow, decidedly paler than in female, the structure essentially as in that sex; antennal segment III about 46 micra, VI without transverse line; major pronotal seta 40-50 micra; fore wings with 4 + 3 setæ in basal third of anterior vein and 2 near tip, posterior vein with 8-9; abdominal tergum IX with a close group of four stout setæ arising from tubercles near posterior margin, the anterior pair closer together than the posterior pair, stouter, and about 12 micra long, the posterior ones about 8 micra.

Measurements of ♂ (allotype), in mm.: Head, length 0.107, width across eyes 0.124, greatest width across cheeks 0.127; interocellar setæ 0.027; prothorax, median length of pronotum 0.088, greatest width 0.165; mesothorax, greatest width 0.217; metathorax, greatest width 0.199; fore wings, length 0.686, width at middle 0.054; abdomen, greatest width (at segment III) 0.192.

Antennal segments:	1	2	3	4	5	6	7	8
Length (micra): ...	18	37	46	40	33	47	10	16
Width (micra): ...	24	24	19	17	17	18	7	5

Total length of antenna 0.247 mm.

COLORADO: along Elk Creek, near Fraser, July 7, 1927, J. D. Hood, in flowers of *Pinus edulis* Engelm., 10 ♀♀, 1 ♂ (including ♀ *holotype* and ♂ *allotype*) [Hood No. 609].

OREGON: Crater Lake National Park, July 21, 1927, J. D. H., on *Ribes cereum* Coult., growing among pines, 1 ♀ [Hood No. 681].

This species is a member of the *ulmifoliorum* group, heretofore unknown from the western hemisphere. The definition of the nine European representatives has not been satisfactorily

accomplished. Nevertheless, the present species should be separable by the longer antennæ, particularly by the long third segment. From the American *divisus* it is readily known by the darker color, shorter tenth urotergum, and the absence of a ventral transverse line or suture near the apex of the sixth antennal segment. The other species known from the United States (*ajugæ* and the new species *coloradensis*) both have a terminal fore-tarsal tooth.

Notes on the Occurrence of Strymon maesites (Herrick-Schäffer) in Florida (Lepid.: Lycaenidae).

By Frank N. Young, University of Florida,
Gainesville, Florida.

Up until a few years ago, the occurrence of *Strymon maesites* (Herrick-Schäffer) in Florida was extremely problematical. No records of it occur in popular works, such as Dr. Holland's *Butterfly Book,* nor in any technical papers with one exception: J. Harold Matteson in his brief paper on the *Rhophalocera of Miami,** gives two records from Miami (a male taken in 1929 and a female in 1923). Neither Seitz nor Bates make any mention of these Florida records.

Nevertheless, *Strymon maesites* is locally rather numerous in Southern Florida. It has been taken frequently in widely varied habitats around Miami by the writer and other local collectors. The first recent record seems to be a specimen taken by Mrs. C. N. Grimshaw in Lawrence Park (April 4, 1933). The specimens on which these notes are largely based were taken by the writer in a distinctive littoral habitat in Brickell Hammock, along the edge of Biscayne Bay south of the Miami River. The dates on these specimens range from July 4, 1933, to July 10, 1935. The longest period over which *maesites* was on the wing was from May 29 to July 10, 1934. During this period a large series was taken at the original habitat, several specimens on palmetto blossoms in the hammock, and two more in a pine wood in the northwest section

* Privately printed.

of Miami. Another record was made during this period by Mrs. C. N. Grimshaw (a female from North Miami Beach during June, 1934). The total number of specimens taken was well over two dozen, which seems to indicate that the species is probably commoner here than in its native habitat in Cuba.

Most of the specimens were in rather good condition which largely excludes the possibility of their having come from Cuba in the adult form. They are extremely swift fliers, and this, with their habit of sitting on the highest flowers available, probably accounts for their rarity in collections. Towards the end of the flight-period in July specimens become badly weathered. The males were at all times much commoner and much more damaged than the females.

The habitat from which the majority of the specimens were taken is located along the edge of the limestone "cliffs" on the west side of Biscayne Bay. Back of the beach is the extensive tropical growth of Brickell which furnishes refuge for many other tropical insects. Most of the specimens of *maesites* were taken from the flowers of a group of button-wood trees on the beach. The surrounding vegetation consists largely of grasses, *Bidens*, nicker-beans, and other typically littoral plants. Along with *maesites, Strymon m-album, martialis, cecrops* and *columella, Lycaena catalina* and *Callidryas statira* were taken from the same button-wood trees.

Specimens were positively determined by Dr. Marston Bates, of the Museum Comparative Zoology, as *Strymon maesites* (Herrick-Schäffer). The specimens are now in the collections of Dr. A. E. Brower, Mr. W. C. Fields, Mr. Oskar Zielinski, Mr. E. A. Ferguson, Mr. B. H. Pickel, Mrs. C. N. Grimshaw, the collection of the M. C. Z. at Harvard and in the private collection of the writer.

Corrections

ENT. NEWS, Vol. XLVIII, page 2, January, 1937.
for Drup read Drap. (Draparnaud.)
for *pentadon* read *pentodon.*

A New Species of Sawfly, Hartigia cowichana, from Canada (Cephidae-Hymenoptera).

By Donald T. Ries, Ithaca, New York.

In studying a series of Cephidae received from Canadian National Collections, Ottawa, Canada, and Illinois Natural History Survey, Urbana, Illinois, two specimens were found belonging to the genus *Hartigia* that represented a new species.

They very closely resemble *Caenocephus aldrichi* Bradley in both size and color, but morphological characters such as the presence of two transverse cubital veins in the hind wing and a single preapical spur on each posterior tibia, shape of left mandible, posterior tarsal claw, and teeth on the ovipositor, structure of antennae and shape of the clypeal margin definitely place them in the genus *Hartigia*.

They differ from the known species of this genus not only in color and appearance but also in structural characters.

Hartigia cowichana new species.

Black, except base of abdomen which is red, tibiae and tarsi amber; wings smoky-hyaline.

♀ — Head transversely subquadrate, very slightly concave behind; vertex closely and evenly covered with setiferous punctures; ocellocular line greater than postocellar line; a distinct oblique impunctate depression laterad of posterior ocelli; ocellar basin shallow and broad; lateral ocellar line about equal to diameter of posterior ocelli; front bluntly raised between antennae; front below antennae evenly punctured and covered with bronze pubescence; antennae with 25 segments, distinctly clavate beyond 3rd segment, tapering slightly at apex, base black, lighter brown from 6th segment to apex; head black, except for small irregular spot on temples and a small spot in clypeocular space yellow; mandibles black with yellow near base, tips mahogany-colored; palpi brown.

Pronotum densely punctured and covered with bronze pubescence; anterior margin concave and slightly upturned; posterior margin indented medially; mesonotum evenly and closely punctured; scutellum shining and sparsely punctured; mesepisternum closely and evenly punctured; membranes of thorax yellowish white.

Wings yellowish-smoky-hyaline with base of costa yellow, stigma and remainder of veins brown; all coxae, trochanters,

femora (except small apical portion which is amber), and basal portion of apical tarsal joint and claws brown; tibiae and reminder of tarsi deep amber.

Abdomen compressed, brownish-black except 2nd and 3rd tergites orange, a small orange spot on 4th tergite just in front of spiracle, lateral margins of 2nd and 3rd tergites with narrow white line, lateral portions of 3rd sternite washed with brownish orange, lower lateral margin of 6th tergite and caudal margin of 6th sternite washed with indistinct orange, hind margins of 7th and 8th tergites edged with yellowish white, and small yellowish white at base of saw-sheath; saw-sheath brownish black, short, blunt and slightly curved downward; saw amber. Length 15 mm.; length of fore wing 9 mm.

♂ — Unknown.

Holotype: ♀ Victoria, BRITISH COLUMBIA, Canada, May 9, 1922 (W. R. Carter), Catalogue Number 4091 in Canadian National Collection, Ottawa, Canada.

Paratype: ♀ Vancouver, British Columbia, Canada, June 6, 1930 (H. Leech), in Academy of Natural Sciences, Philadelphia, Pennsylvania.

The biology and host plant of this species are unknown.

OBITUARY

The death of LAWRENCE BRUNER, Professor of Entomology in the University of Nebraska since 1895, as having occurred on January 30, 1937, is reported in *Science* for February 12th. According to *Who's Who in America*, he was born in Catasauqua, Lehigh County, Pennsylvania, March 2, 1856, the son of Uriah and Amelia (Brobst) Bruner. He was a student at the University of Nebraska, where he received a honorary degree of Bachelor of Science in 1897, having been an instructor in entomology there, from 1890 to 1895. He was well known as an investigator of the Orthoptera in Argentina and in the United States, and as author of two reports on the Destructive Locust of Argentine, papers on Locusts of Paraguay and of Peru, on the Saltatory Orthoptera of Brazil, the second volume on Orthoptera of the *Biologia Centrali-Americana*, a preliminary catalogue of Philippine Orthoptera, and many other entomological contributions. Some of his collections of Orthoptera were acquired by Mr. Morgan Hebard, of Philadelphia.

Entomological Literature

COMPILED BY V. S. L. PATE, LAURA S. MACKEY and E. T. CRESSON, Jr.

Under the above head it is intended to note papers received at the Academy of Natural Sciences, of Philadelphia, pertaining to the Entomology of the Americas (North and South), including Arachnida and Myriopoda. Articles irrelevant to American entomology will not be noted; but contributions to anatomy, physiology and embryology of insects, however, whether relating to American or exotic species will be recorded.

The **figures within brackets** [ ] refer to the journal in which the paper appeared, as numbered in the list of Periodicals and Serials published in our January and June issues. This list may be secured from the publisher of ENTOMOLOGICAL NEWS for 10c. The number of, or annual **volume**, and in some cases the part, heft, &c. the latter **within** ( ) follows; then the pagination follows the **colon** :

All continued papers, with few exceptions, are recorded only at their first installments.

(*) Papers containing new forms or names not so stated in titles, have an * within parentheses thus (*) following the pagination of reference to paper.

(S) Papers pertaining exclusively to neotropical species, and not so indicated in the title, have the symbol (S) at the end of the title of the paper.

For records of Economic Literature, see the Experiment Station Record, Office of Experiment Stations, Washington. Also Review of Applied Entomology, Series A, London. For records of papers on Medical Entomology, see Review of Applied Entomology, Series B.

Note. Titles of papers containing new forms or new names will be indicated by an asterisk within parentheses at end of reference, (*).

Papers published in the Entomological News are not listed.

GENERAL.—Ballou, C. H.—Insect notes from Costa Rica in 1935. [Insect Pest Surv. Bull., U. S. Bur. Ent.] 16: 437-497. **Barnes, H. F.**—Recent advances in entomology. [Sci. Progr.] 31: 518-526. **Blaufuss, A. H.**—The care of living material in the laboratory. [Turtox News.] 15: 4-5, ill. **Donisthorpe, H.**—An extract. [21] 49: 8-9. **Grankina, K.**—Washing of the soil as a method for recording small soil insects. [Lenin Ac. Ag. Sci. Plant Prot.] No. 9: 124-125. **Hayward, K. J.**—Random notes on Argentine collecting. 3. The Riverain forests of the Chacosantafecino. [21] 49: 5-8. **Lhomme, L.**—Lettre ouverte sur la preparation des papillons de petite taille. [Amat. Papillons] 8: 124-137, 147-151. **Park, T.**—Experimental studies of insect populations. [90] 71: 21-33. **Roi.**—Elements biogeographiques de l'Irlande. [Ann. Soc. Sci. Bruxelles] B, 56: 433-458, ill. **Ruediger, E.**—Entomologie und zeitung. [Ent. Jahrbuch] 1937: 83-86. **Tiensuu, L.**—Insect Life on plants attacked by Aphids. [Ann. Ent. Fenn.] 2: 161-169. **von Tunkl, F. F.**—Die romantik in der Entomologie. [Ent. Jahrbuch] 1937: 74-82, cont. **Wolcott, G. N.**—An animal census of two pastures and a meadow in northern New York. [Ecolog. Monogr.] 7: 1-90.

ANATOMY, PHYSIOLOGY, ETC.—Adamczewski.—Etude sur la morphologie des espèces du genre Cnephasia (Tortricidae) et sur leur distribution géographique en Pologne. [Ann. Mus. Zool. Polonici] 2: 263-294, ill. **Asana**

& Kichijo.—The chromosomes of six species of ant-lions. [Jour. Fac. Sci. Hokkaido Imp. Univ.] 5, Zool.: 121-136, ill. **Baden, V.**—Embryology of the nervous system in the grasshopper, Melanoplus differentialis (Orth: Acrididae). [Journ. Morph.] 60: 159-188, ill. **Barbarossa, R.**—Osservazioni sulla morfologia dell' addome e sull' armatura genitale del Grillotalpa (Orth.) [Arch. Zool. Ital. Turin] 23: 479-492, ill. **Beadle & Ephrussi.**—Development of eye colors in Drosophila: the mutants bright & mahogany. [90] 71: 91-95. **Berio, E.**—Osservazioni sulla morfologia e nomenclatura dell' apparato copulatore dei Lepidotteri. Che cosa siano realmente l'uncus e lo scaphium. [Festschrift E. Strand, Riga, 1936.] 2: 205-211, ill. **Bonneville, P.-P.**—Recherches sur l'anatomie microscopique des termites. [Arvernia Biol.] 1936: 1-123, ill. **Bushnell, R. J.**—The development & metamorphosis of the mid-intestinal epithelium of Acanthoscelides obtectus (Coleoptera). [Journ. Morph.] 60: 221-241, ill. **Camerlengo, A.**—Osservazioni sulla morfologia del torace del Grillotalpa (Orth.) [Arch. Zool. Ital. Turin] 23: 453-478, ill. **Emery, W. T.**—Hessian fly eggs and freezing temperatures. [103] 10: 28-29. **Fleming, Baker & Koblitsky.**—The insecticidal action of lead arsenate on the larvae of the Japanese beetle in different types of soil. [47] 53: 771-779. **Gabler, H.**—Beitrag zur Kenntnis von Stigmenbau und Funktion der Lepidopteren-Puppen. [97] 56: 584-590, ill. **Gala, C.**—Sur quelques effets de la poudre de chorion sur la biologie de la mouche Drosophila melanogaster, varieties Wild et Vestigial. [Bull. Internat. Acad. Tcheq. Sci., Prague] 36: 68-70. **Goldschmidt, R.**—Does the quantity of chromatin produce a genetic effect? [90] 71: 83-86. **Haskins & Enzeman.**—Modifications of the compound eye of Drosophila melanogaster arising under X-irradiation. [90] 71: 87-90, ill. **Hester & Cunningham.**—The effects of endocrines on the development rates of fleshflies. [J. Elisha Mitchell Sc. Soc.] 52: 38-50. **Husain & Mathur.**—Studies on Schistocerca gregaria. VIII.—Influence of Carbon dioxide on development of black pigmentation in Schistocerca gregaria (Orthopt: Acrididae). [Ind. J. Agr. Sci.] 6: 1005-1030, ill. **Huxley & Wolsky.**—Zur Frage der Entwicklungs-physiologischen Determination des Arthropodenauges. [97] 56: 571-572. **Koch & Krogh.**—La fonction des papilles anales des larves de Dipteres. [Ann. Soc. Sci. Bruxelles] B, 56: 459-461. **Kozhantshikov, W.**—To the problem of the vital thermal optimum. III. The loss of

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